

CLAIMS

What is claimed is

- 1 1. A method of implementing Internet Protocol (IP) hosts on an application specific bus
2 without disrupting the application specific bus comprising:
3 determining an application specific bus address of a remote device, said remote
4 device having an IP address in addition to the application specific bus
5 address;
6 formatting a message conforming to the application specific bus, said message
7 containing an IP datagram and message identifiers;
8 transmitting the message on the application specific bus;
9 receiving the message at the remote device based upon the application specific
10 bus address;
11 authenticating the message as an IP message based upon the message identifiers;
12 and
13 extracting the IP datagram from the message and processing the IP datagram by
14 a conventional IP network processing protocol.

- 1 2. The method of claim 1 wherein the step of determining further comprises:
2 formatting an application specific bus address request message;
3 transmitting the address request message on the application specific bus; and
4 receiving an address reply message, the reply message containing the application
5 specific bus address of the remote device.
- 1 3. The method of claim 2 wherein the address reply message is received from the
2 remote device.
- 1 4. The method of claim 1 wherein the step of transmitting further comprises:
2 maintaining an averaging interval by at least one IP host;
3 determining a total number of frames of all types present on the application
4 specific bus from all sources during the averaging interval; and
5 adjusting a protocol rate limit at the end of the averaging interval.
- 1 5. The method of claim 4 wherein adjusting a protocol rate limit further comprises:
2 if the total number of frames is greater than 0.9 times a network capacity,
3 decreasing the protocol rate limit; and
4 if the total number of frames is less than 0.8 times the network capacity,
5 increasing the protocol rate limit.

1 6. The method of claim 4 wherein the at least one IP host uses less than protocol rate
2 limit percent of an application specific bus capacity to transmit frames using the
3 protocol rate limit.

1 7. The method of claim 6 wherein the application specific bus capacity is 2000 frames
2 per second.

1 8. The method of claim 1 wherein the step of authenticating further comprises:
2 looking-up the application specific bus address for the remote device in a cache;
3 and
4 if the application specific bus address for the device is not found in the cache,
5 formatting an application specific bus query message,
6 transmitting the query message on the application specific bus,
7 receiving a query reply message comprising the application specific bus
8 address for the remote device, and
9 adding the application specific bus address for the remote device to the
10 cache.

1 9. A method of implementing Internet Protocol (IP) hosts on an application specific bus
2 without disrupting operation of the application specific bus, comprising:
3 determining an application specific bus address of a remote device, said remote
4 device having an IP address in addition to the application specific bus
5 address;
6 formatting a message conforming to the application specific bus, said message
7 containing an IP datagram and message identifiers; and
8 transmitting the message on the application specific bus.

1 10. The method of claim 9 wherein the step of determining further comprises:
2 formatting an application specific bus address request message;
3 transmitting the address request message on the application specific bus; and
4 receiving an address reply message, the reply message containing the application
5 specific bus address of the remote device.

1 11. The method of claim 10 wherein the address reply message is received from the
2 remote device.

1 12. The method of claim 9 wherein the step of transmitting further comprises:
2 maintaining an averaging interval by at least one IP host;
3 determining a total number of frames of all types present on the application
4 specific bus from all sources during the averaging interval; and
5 adjusting a protocol rate limit at the end of the averaging interval.

- 1 13. The method of claim 12, wherein adjusting a protocol rate limit further comprises:
2 if the total number of frames is greater than 0.9 times a network capacity,
3 decreasing the protocol rate limit; and
4 if the total number of frames is less than 0.8 times the network capacity,
5 increasing the protocol rate limit.
- 1 14. The method of claim 12, wherein the at least one IP host uses less than protocol rate
2 limit percent of an application specific bus capacity to transmit frames using the
3 protocol rate limit.
- 1 15. A method of implementing Internet Protocol (IP) hosts on an application specific
2 bus without disrupting the application specific bus, comprising:
3 receiving a message based upon an application specific bus address, said
4 message including an IP datagram and message identifiers;
5 authenticating the message as an IP message based upon the message identifiers;
6 and
7 extracting the IP datagram from the message and processing the IP datagram by
8 a conventional IP network processing protocol.

1 16. The method of claim 15 wherein the step of authenticating further comprises:
2 looking-up the application specific bus address for the remote device in a cache;
3 and
4 if the application specific bus address for the device is not found in the cache,
5 formatting an application specific bus query message,
6 transmitting the query message on the application specific bus,
7 receiving a query reply message, and
8 adding the application specific bus address for the remote device to the
9 cache.

1 17. A method of implementing Internet Protocol (IP) hosts on an application specific
2 bus without disrupting the application specific bus comprising:
3 providing a set of IP hosts, each of said set of IP hosts having an IP address and
4 an application specific bus address;
5 receiving a data message from an application within one of the set of IP hosts;
6 formatting a transmittal message conforming to the application specific bus, said
7 transmittal message containing the data message and message identifiers; and
8 transmitting the data message on the application specific bus to a second of one
9 of the set of IP hosts based upon an application specific bus address of the
10 second of one of the set of IP hosts.

1 18. A method of implementing Internet Protocol (IP) hosts on an application specific
2 bus without disrupting the application specific bus comprising:
3 receiving a request that a datagram be sent to an IP host identified by an IP
4 network address, the IP address contained within the request;
5 requesting a physical address for a control-based network device corresponding
6 to the IP address;
7 receiving a reply message from the network device containing the physical
8 address; and
9 transmitting IP packets over the control-based network in a manner appropriate
10 to the control-based network.

1 19. A computer-readable medium comprising program instructions for implementing
2 Internet Protocol (IP) hosts on an application specific bus without disrupting the
3 application specific bus by performing the steps of:

4 determining an application specific bus address of a remote device, said remote
5 device having an IP address in addition to the application specific bus
6 address;

7 formatting a message conforming to the application specific bus, said message
8 containing an IP datagram and message identifiers; and

9 transmitting the message on the application specific bus.

1 20. The medium of claim 19 wherein the step of determining further comprises:

2 formatting an application specific bus address request message;

3 transmitting the address request message on the application specific bus; and

4 receiving an address reply message, the reply message containing the application
5 specific bus address of the remote device.

1 21. The medium of claim 19 wherein the step of transmitting further comprises:

2 maintaining an averaging interval by at least one IP host;

3 determining a total number of frames of all types present on the application

4 specific bus from all sources during the averaging interval; and

5 adjusting a protocol rate limit at the end of the averaging interval.

1 22. A computer-readable medium comprising program instructions for implementing
2 Internet Protocol (IP) hosts on an application specific bus without disrupting the
3 application specific bus by performing the steps of:
4 receiving a message based upon an application specific bus address, said
5 message including IP data and message identifiers;
6 authenticating the message as an IP message based upon the message identifiers;
7 and
8 extracting the IP data from the message and processing the IP data by a
9 conventional IP network processing protocol.

1 23. The medium of claim 22 wherein the step of authenticating further comprises:
2 looking-up the application specific bus address for the remote device in a cache;
3 and
4 if the application specific bus address for the device is not found in the cache,
5 formatting an application specific bus query message,
6 transmitting the query message on the application specific bus,
7 receiving a query reply message, and
8 adding the application specific bus address for the remote device to the
9 cache.

1 24. A system for implementing Internet Protocol (IP) hosts on an application specific
2 bus without disrupting operation of the application specific bus, comprising:
3 means for determining an application specific bus address of a remote device,
4 said remote device having an IP address in addition to the application
5 specific bus address;
6 means for formatting a message conforming to the application specific bus, said
7 message containing IP data and message identifiers; and
8 means for transmitting the message on the application specific bus.

1 25. A system for implementing Internet Protocol (IP) hosts on an application specific
2 bus without disrupting the application specific bus, comprising:
3 means for receiving a message based upon an application specific bus address,
4 said message including IP data and message identifiers;
5 means for authenticating the message as an IP message based upon the message
6 identifiers; and
7 means for extracting the IP data from the message and processing the IP data by
8 a conventional IP network processing protocol.

1 26. A system for implementing Internet Protocol (IP) hosts on an application specific
2 bus without disrupting the application specific bus comprising:
3 a message formatted according to the application specific bus, said message
4 containing IP data and message identifiers;
5 at least one source IP host connected to the application specific bus, said at least
6 one source IP host places the message on the application specific bus; and
7 at least one destination IP host connected to the application specific bus, said at
8 least one destination IP host having an IP address and an application specific
9 bus address, said at least one destination IP host receives the message based
10 upon the application specific bus address, authenticates the message as an IP
11 message based upon the message identifiers, and extracts the IP data from the
12 message.

1 27. The system of claim 26 wherein the at least one source IP host further formats an
2 application specific bus address request message; transmits the address request
3 message on the application specific bus; and receives an address reply message, the
4 reply message containing the application specific bus address of the at least one
5 destination IP host.

1 28. The system of claim 26 wherein the at least one source IP host further maintains an
2 averaging interval; determines a total number of frames of all types present on the
3 application specific bus from all sources during the averaging interval; and adjusts a
4 protocol rate limit at the end of the averaging interval, the at least one source IP host
5 uses less than protocol rate limit percent of an application specific bus capacity to
6 transmit the frames.

1 29. A system for implementing Internet Protocol (IP) hosts on an application specific
2 bus without disrupting operation of the application specific bus, comprising:
3 a message formatted according to the application specific bus, said message
4 containing IP data and message identifiers, the message identifiers used to
5 authenticate the message as an IP message; and
6 at least one IP host connected to the application specific bus, said at least one IP
7 host configured to transmit the message on the application specific bus.

1 30. The system of claim 29 wherein the at least one IP host is further configured to
2 format an application specific bus address request message; transmit the address
3 request message on the application specific bus; and receive an address reply
4 message, the reply message containing the application specific bus address of a
5 remote device.

1 31. A system for implementing Internet Protocol (IP) hosts on an application specific
2 bus without disrupting the application specific bus comprising:
3 a message formatted according to the application specific bus, said message
4 containing IP data and message identifiers;
5 at least one IP host connected to the application specific bus, said at least one IP
6 host having an IP address and an application specific bus address, said at
7 least one IP host configured to receive the message based upon the
8 application specific bus address, authenticate the message as an IP message
9 based upon the message identifiers, and extract the IP data from the message.

1 32. The system of claim 31 wherein the at least one destination IP host further
2 comprises:
3 a cache containing application specific bus addresses for remote devices for
4 authenticating the message.

1 33. The system of claim 32 wherein the at least one destination IP host is further
2 configured to look-up the application specific bus address for the remote device in
3 the cache;
4 if the application specific bus address for the device is not found in the cache, the
5 at least one destination IP host is further configured to format an application
6 specific bus query message, transmit the query message on the application
7 specific bus, receive a query reply message, and add the application specific
8 bus address for the remote device to the cache.